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FAT CONTENT OF GROUND BEEF

By Lester Hankin and J. Gordon Hanna

A cooperative study by The Connecticut Agricultural Experiment Station and the Connecticut Department of Consumer Protection

A favorite meat consumed by persons of all ages is ground beef, variously called ground beef, hamburger, chopped beef, ground round, ground sirloin, ground chuck, and still other names depending on the cut of beef used. Ground beef accounts for about 30% of all processed beef (2).

Connecticut Regulations (1) pertaining to ground beef are as follows:

> "Chopped beef or ground beef shall consist of chopped fresh and/or frozen beef with or without seasoning and without the addition of beef fat as such, shall not contain more than 30% fat, and shall not contain added water, binders, or extenders."
> "Hamburger shall consist of chopped fresh and/or frozen beef with or without the addition of beef fat as such and/or seasoning, shall not contain more than 30 percent fat, and shall not contain added water, binders, or extenders."

In stores ground beef is sometimes labeled as regular, lean, or extra lean, but no Connecticut Regulations pertain to such designations nor is there any way for the consumer to relate them to fat content. If, however, merchants declare a specific amount, as, for example, not more than 18% fat or not less than 82% lean, the meat must comply with the label. If the ground beef is labeled as to a cut of meat, for example, ground chuck or ground round, it must have no more than 30% fat unless a specific fat content is designated.

This Bulletin reports a survey of fresh ground beef at retail stores. The samples were evaluated for compliance with the regulated maximum of 30% fat and the content declared on the label. Fat contents were compared among samples labeled regular, lean, and extra lean.

Methods

Samples were collected by inspectors of the Connecticut Department of Consumer Protection. Two hundred and seven samples of fresh ground beef were collected during January 1982-April 1983. Unless the label claimed lower fat content, samples were considered to be regular ground beef and subject to the maximum allowance of 30% fat. Most samples were collected at retail stores and four at fast food restaurants. Samples were delivered to the laboratory and either tested immediately or frozen until tested. Analyses were by methods described in Official Methods of Analysis (3). Samples were tested in duplicate for amount of fat, and the average of the two analyses is reported. Because of the variability inherent in obtaining a representative sample for analysis and in the analysis itself, samples found to be less than 0.5% above the 30% standard or stated claim were not considered to contain excessive fat.

Results and Discussion

Beef contains muscle and connective tissue as well as fat. When beef is ground, the resulting material is particulate rather than completely homogeneous. Thus, there is some variability in obtaining a representative sample for fat analysis. Because of this inherent variability, duplicate samples are always run, and the results averaged. Analysis of our data shows an average difference of 0.9% fat between duplicates, with a standard deviation about the mean of 0.6%.

The fat contents, expressed as percentage of fresh weight, are shown in Table 1. The 103 samples of regular ground beef, 37 ground chuck, and 28 lean ground beef all averaged about 21% fat (Table 2). The standard deviations about the mean were similar. Both the 17 samples of extra lean ground beef and the 9 ground round averaged about 16% fat. The 9 samples of ground sirloin averaged 17% fat.

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Table 1. Fat content of various types of ground beef

Vendor	% Fat Found	% Fat Claimed[a]
REGULAR GROUND BEEF		
Andy's Food Town, Main St., East Hartford	14.3	
Basic Food Warehouse, E. Main St., Meriden	24.9	
Beit Bros. Supermarket, Main St., Norwich	15.4	
Beit Bros. Supermarket, Main St., Norwich	31.5	
Bennie's Farms Market, Railroad Ave., Essex	15.8	
Bergeron's Foodland, Windsor Rd., Willimantic	29.1	
Blue Star Kosher Products, Boston, MA	19.1	
Brookfield Market, Wisconsin Rd., Brookfield	17.0	
Burger King, Enfield St., Enfield	25.4	
Caron's Corner, Harbour St., Branford	25.5	
Charlie's Supermarket, Hamilton Ave., Norwich	29.0	
Copaco, Cottage Grove Rd., Bloomfield	19.1	
Country Market, Route 9A, Higganum	16.6	
Crosstown Supermarket, Route 7, New Milford	23.1	
Crown Market, Albany Ave., West Hartford	12.6	
Davis IGA Foodliner, Kent Green, Kent	18.5	
Edwards Food Warehouse, Queen St., Southington	29.6	
Edwards Food Warehouse, Queen St., Southington	27.3	
Elm Super Market, Valley St., Willimantic	15.5	
Ferraro's Foods, Farmington Ave., Bristol	26.1	
Finast Big Buy, Black Rock Tpk., Fairfield	26.4	28
First National, Main St., Bridgeport	22.4	
First National, Main St., Bridgeport	24.6	28
First National, Main St., Bridgeport	19.0	
First National, N. Main St., Bristol	25.5	
First National, Route 44, Canaan	23.9	
First National, White St., Danbury	29.9	
First National, Ellington Blvd., East Hartford	24.3	
First National, Black Rock Tpk., Fairfield	23.6	28
First National, Pennsylvania Ave., Niantic	26.8	
First National, Barnum Ave., Stratford	22.1	28
First National, Barnum Ave., Stratford	19.3	28
First National, Barnum Ave., Stratford	22.8	28
Food Center of Westbrook, Main St., Westbrook	18.0	
Food Center of Westbrook, Main St., Westbrook	21.0	
Food Mart-Waldbaums, Elm St., Enfield	19.8	
Friendly, Elm St., Enfield	19.0	
Friendly Grocer, Fairfield Ave., Bridgeport	27.1	
G & H Village Market, Hartford Ave., Granby	17.8	
Glenwood Market, Glenwood Rd., Clinton	15.8	
GranCentral Market, Stratfield Rd., Fairfield	39.9	
GranCentral Market, New Haven Ave., Milford	25.3	
GranCentral Market, New Haven Ave., Milford	20.5	
GranCentral Market, New Haven Ave., Milford	20.3	
GranCentral Market, New Haven Ave., Milford	18.1	
GranCentral Market, New Haven Ave., Milford	19.3	
GranCentral Market, New Haven Ave., Milford	18.9	
Grand Central Market, N. Main St., S. Norwalk	22.1	
Grand Union, Old Kings Hwy., Darien	24.4	
Grand Union, S. Main St., Middletown	26.3	
Great A & P Tea Co., Boston Ave., Bridgeport	29.3	
Great A & P Tea Co., Pine St., Bristol	28.6	
Great A & P Tea Co., Farmington Ave., Hartford	25.5	
Great A & P Tea Co., River Rd., Shelton	24.4	
Great A & P Tea Co., Willow St., Winsted	16.9	
Griazzo Food Center, East St., Plainville	20.1	
Guilford Food Center, Whitfield St., Guilford	24.4	
Hill Street Market, S Hill St., Ansonia	12.1	
Honan's Market, Route 7, Gaylordsville	9.1	
Ivoryton Store, Main St., Ivoryton	11.6	
Klarides Supermarket, New Haven Ave., Derby	14.8	
Madison Meat Market, Boston Post Rd., Madison	20.0	
Marandino's, Route 44, New Hartford	16.1	
Marbledale Mkt Locker Plant, Rt. 200, Marbledale	17.4	
McDonalds, Enfield St., Enfield	25.3	
Michael's Market, Route 14, Main St., Canterbury	23.4	
Motts Shop Rite, Elm St., Enfield	16.6	
Northville General Store, Route 202, Northville	24.5	
Pegnataro's, Dixwell Ave., Hamden	17.4	
Pathmark, Main St., East Haven	14.3	
Pathmark, Main St., East Haven	21.4	
Palmers, Heights Rd., Darien	16.9	
People's Whse. Foods, Boston Post Rd., Bridgeport	20.6	
Pik Kwik Stores, Main St., Southington	21.8	
Posnock Meat Provision, Linden, NJ	20.9	
Ridgewood Market, Franklin St., Danbury	10.5	
Roland's Supermarket, Route 195, Tolland	22.8	
Savage Food Market, Burnside Ave., East Hartford	14.6	
Shop Rite-Motts, Washington St., Middletown	11.4	
Shop Rite Supermarket, Sturtevant St., Norwich	17.6	30
Shopping Bags Foodland, E. Main St., Rockville	17.1	
South Side Superette, South st., Willimantic	26.4	
Stop & Shop, Main St., Middletown	20.6	
Stop & Shop, Main St., Willimantic	21.5	
Stop & Shop, Silver Lane, East Hartford	29.3	
Stop & Shop, Conn. Post Center, Milford	19.3	
Stop & Shop, Quality St., Trumbull	22.4	
Stop & Shop, Boston Post Rd., Waterford	20.0	
Sunshine Farms, Main St., Clinton	7.5	
Sunshine Farms, Main St., Clinton	8.1	
Ted's Market, Route 66, Hebron	13.3	
Tom's Market, Putnam Ave., Hamden	13.6	
Tops Supermkt., Meriden-Wtby Rd., Southington	25.4	
Village Grocery, Main St., Chester	21.4	
Waldbaum's, Park Ave., Bridgeport	19.5	
Waldbaum's, Connecticut Avenue, Norwalk	21.6	
Waldbaum's, Hawley Lane, Trumbull	27.3	28
Warren Country Store, Route 45, Warren	13.1	
Washington Food Market, Washington Depot	12.8	
Waz's Supermarket, Farmington Ave., Bristol	19.8	
Wendy's, Turnpike Rd., Windsor Locks	25.4	
Winsted Super Saver, Main St., Winsted	21.8	
Ye Olde Butcher Shop, Whitney Ave., Hamden	11.8	
GROUND CHUCK		
Bethel Food Market, Greenwood Ave., Bethel	20.6	27
Bongiorno Supermarket, West Ave., Stamford	21.3	
Boston Beef Provisions, Boston Ave., Bridgeport	26.0	
Cheshire IGA South, Highland Ave., Cheshire	18.0	
Colonial Market, Founders Plaza, East Lyme	24.9	
Crown Market, Whalley Ave., New Haven	19.3	
Deep's Market, North St., Danbury	22.8	
Ellington Food Center, Church St., Ellington	14.4	
Essex Food Mart, Main St., Essex	22.0	
Frank's Supermarket, Welles St., Glastonbury	23.3	
Frank's Supermarket, S. Main St., West Hartford	14.5	
Food Mart, Farmington Ave., Bristol	23.0	23
Food Mart, Farmington Ave., Bristol	20.6	23
Grade A Market, Post Rd., Darien	22.5	
GranCentral Market, Stratfield Rd., Fairfield	17.8	
GranCentral Market, Boston Ave., Stratford	22.0	
GranCentral Market, New Haven Ave., Milford	23.0	
Grand Central Market, Summer St., Stamford	22.3	
Grand Union, Old Kings Hwy., Darien	33.6	
Grand Union, White Plains Rd., Trumbull	11.4	
Great A & P Tea Co., Boston Ave., Bridgeport	30.0	
Great A & P Tea Co., Boston Post Rd., Old Lyme	22.8	
Great A & P Tea Co., River Rd., Shelton	17.1	
Great A & P Tea Co., Silas Deane Hwy., Wethersfield	22.9	
Indian Neck General Store, Branford	19.3	
Mitchell's Suprmkt., Boston Post Rd., Old Saybrook	23.3	
Morey's Food Locker, East St., New Milford	23.1	
Pegnataro's, Route 1, Saybrook	16.5	
People's Whse. Foods, Boston Ave., Bridgeport	23.8	
Shop Rite, Boston Post Rd., Orange	20.9	
Shop Rite, Barnum Ave., Bridgeport	23.2	
Sunshine Farms, E. Main St., Clinton	6.8	
Waldbaum's, Park Ave., Bridgeport	20.0	
Waldbaum's, Turnpike, Milford	23.0	

Vendor	% Fat Found	% Fat Claimed[a]
Waldbaum's, Bridgeport Ave., Milford	23.5	
Warehouse Foods, Albany Ave., West Hartford	26.5	
Warehouse Foods, Orange Ave., West Haven	20.8	
LEAN GROUND BEEF		
Cheshire IGA South, S. Main St., Cheshire	17.1	
Cheshire IGA South, S. Main St., Cheshire	25.1	
Crown Supermarket, Albany Ave., West Hartford	13.1	
Edwards Food Whse., Queen St., Southington	23.5	22
Edwards Food Whse., Queen St., Southington	25.0	22
Everybody's Supermarket, S. Main St., Cheshire	21.5	
Finast Big Buy, Black Rock Tpk., Fairfield	24.5	22
Finast, Kane St., West Hartford	24.5	22
First National, Main St., Bridgeport	21.6	
First National, Main St., Bridgeport	18.6	22
First National, Barnum Ave., Bridgeport	23.9	22
First National, Barnum Ave., Bridgeport	19.1	22
First National, Barnum Ave., Bridgeport	21.0	22
First National, Pennsylvania Ave., Niantic	25.8	
First National, Barnum Ave., Stratford	24.8	22
Food Mart, New Britain Ave., West Hartford	15.3	23
Great A & P Tea Co., Boston Ave., Bridgeport	17.0	
Motts Shop Rite, E. Middle Tpk., Manchester	20.4	
Shop Rite, Boston Post Rd., Milford	22.6	20
Shop Rite, Boston Post Rd., Milford	15.0	20
Shop Rite, Slater Ave., New Britain	21.8	20
Shop Rite, Queen St., Southington	20.5	20
Shop Rite, Queen St., Southington	20.5	20
Stop & Shop, Park St., Hartford	20.8	
Stop & Shop, Conn Post Center, Milford	17.6	
Stop & Shop, Quality St., Trumbull	21.6	
Waldbaum's, Hawley Lane, Trumbull	21.5	23
Waldbaum's, Amity Rd., New Haven	19.0	23
EXTRA LEAN GROUND BEEF		
Finast, Kane St., West Hartford	12.8	14
Finast, Kane St., West Hartford	18.3	14
Finast Big Buy, Black Rock Tpk., Fairfield	14.9	14
First National, Main St., Bridgeport	19.0	14
First National, Main St., Bridgeport	21.3	16
First National, Main st., Bridgeport	11.3	
First National, Barnum Ave., Bridgeport	19.9	16
First National, Barnum Ave., Bridgeport	10.1	16
First National, Main St., Bridgeport	15.4	
First National, Black Rock Tpk., Fairfield	16.8	16
First National, Cherry St., Milford	18.5	
First National, Barnum Ave., Stratford	11.3	16
Shop Rite, Boston Post Rd., Milford	15.0	15
Stop & Shop, Conn. Post Center, Milford	13.4	
Stop & Shop, Quality St., Trumbull	22.3	
Waldbaum's, Amity Rd., New Haven	12.3	17
Waldbaum's, Hawley Lane, Trumbull	17.9	17
GROUND SIRLOIN		
First National, Main St., Bridgeport	22.0	14
First National, Barnum Ave., Bridgeport	19.3	14
First National, Barnum Ave., Bridgeport	9.3	14
First National, Black Rock Tpk., Fairfield	14.0	14
First National, Cherry St., Milford	20.0	
Great A & P Tea Co., Boston Ave., Bridgeport	18.8	
People's Whse. Foods, Boston Ave., Bridgeport	13.1	
Waldbaum's Food Mart, Elm St., Enfield	23.3	13
Waldbaum's Food Mart, Elm St., Enfield	15.8	13
GROUND ROUND		
GranCentral Market, Boston Ave., Stratford	16.0	
GranCentral Market, New Haven Ave., Milford	15.5	
Grand Union, White Plains Rd., Trumbull	11.6	
Great A & P Tea Co., Boston Ave., Bridgeport	18.0	
Mitchell's Supermarket, Main St., Niantic	15.6	10
Waldbaum's, Park Ave., Bridgeport	14.8	
Waldbaum's, Turnpike, Milford	18.0	17
Waldbaum's, Turnpike, Milford	9.0	
Warehouse Foods, Orange Ave., West Haven	27.4	
GROUND SIRLOIN TIP		
Grand Union, White Plains Rd., Trumbull	9.3	
People's Whse. Foods, Boston Ave., Bridgeport	10.6	
GROUND BEEF LOIN STEAK		
First National, Main St., Bridgeport	16.6	
NECK AND TENDERLOIN		
Grand Central Market, Summer St., Stamford	22.3	

[a] The percentage of fat designated under the claimed amount indicates a "not more than" or maximum amount. Some samples, however, had labels such as "greater than 70% lean" or "not less than 90% lean" which we interpreted as 30% and 10% fat, respectively. For uniformity, we have converted such declarations to a maximum amount of fat.

Table 2. Average percent of fat in various types of ground beef

Product	Number of samples	% Fat Average ± standard deviation	% Fat Range
Regular ground beef	103	20.7 ± 5.6	9.1 - 39.9
Ground chuck	37	21.3 ± 4.7	6.8 - 33.6
Lean ground beef	28	20.8 ± 3.3	13.1 - 25.8
Extra lean ground beef	17	15.9 ± 3.6	10.1 - 22.3
Ground sirloin	9	17.3 ± 4.3	9.3 - 23.3
Ground round	9	16.2 ± 4.8	9.0 - 27.4

Table 3. Significant differences in fat content among various types of ground beef. p = < 0.01 means the difference is statistically significant at the 1% level, p = < 0.05 at the 5% level and NS not significant.

Product	Regular ground beef	Ground chuck	Lean ground beef	Extra Lean ground beef	Ground sirloin	Ground round
Regular ground beef	—	NS	NS	p=<0.01	NS	p=<0.05
Ground chuck		—	NS	p=<0.01	p=<0.05	p=<0.01
Lean ground beef			—	p=<0.05	NS	p=<0.01
Extra lean ground beef				—	NS	NS
Ground sirloin					—	NS
Ground round						—

In Table 3 we present an analysis of the differences in fat among different types of ground beef. There were no significant differences among regular ground beef, ground chuck, and lean ground beef. Neither were there any significant differences between regular ground beef and ground sirloin or ground round. Similarly, there was no significant difference between ground sirloin and ground round.

There were, however, some statistically significant differences among some types of ground beef (Table 3), such as less fat in extra lean than ground chuck, and less in extra lean than in lean ground beef. The fat in ground round was also significantly less than in regular ground beef, ground chuck, and lean ground beef.

When ground beef is designated according to the original cut, for example, ground round, less fat may be expected than, for example, in regular ground beef. Since beef round contains about 12% fat (4), ground round should not contain more than 12% unless fat is added. The same applies to sirloin which contains about 17% fat, and chuck with about 19% fat (4). The designations regular, lean, and extra lean have no relation to the original cut of meat, and they may contain different types of beef muscle. Although chuck, sirloin, and round designate specific types of beef muscle, once the meat is ground there is no way to determine the particular cut that was used.

A specific claim about fat was noted on labels of 48 samples (Table 1). Twenty contained more than the declared amount. The other 159 samples did not claim a fat content, and only three of these contained more than 30% fat.

Conclusions

Connecticut Regulations allow a maximum of 30% fat, unless less is specified on the label of ground beef.

Over 200 samples of fresh ground beef were collected in Connecticut stores and tested for fat. Regular ground beef, ground chuck, and lean ground beef all averaged about 21% fat. Extra lean ground beef and ground round averaged about 16% fat, and ground sirloin about 17%.

There were no significant differences in fat content among regular ground beef, ground chuck, and lean ground beef samples. Extra lean ground beef had significantly less fat than regular ground beef, ground chuck, and lean ground beef, but did not differ significantly from ground sirloin or ground round.

Among 159 samples not claiming fat content, 3 samples contained more than 30% fat, and among 48 samples making a specific claim about fat, 20 exceeded the declared amount.

Acknowledgements

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